UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

DATE:

SUBJECT: Removal Site Evaluation for the Superior Barrel and Drum Site, Elk Township, Gloucester County, New Jersey (Site ID A23K, CERCLIS ID NJD986630705)

FROM: Margaret Gregor, On-Scene Coordinator
Removal Action Branch

TO: Joseph D. Rotola, Chief
Removal Action Branch

The purpose of this Removal Site Evaluation is to document the findings of the multi-media removal assessment conducted by the United States Environmental Protection Agency (EPA) Region II Removal Action Branch (RAB) at the Superior Barrel and Drum Site (Site), a former drum and container reconditioning facility and wholesale industrial supplier located in Elk Township, Gloucester County, New Jersey. The assessment was conducted between May and November 2014 to determine whether contaminants from containers which were removed from the Site were still present on-site and in the Site vicinity at levels which pose a threat to human health or the environment.

The Site is located at 798 Jacob Harris Lane, also known as 830 Jacob Harris Lane (formerly New Jersey Avenue), in Elk Township, Gloucester County, New Jersey (coordinates 39.6869, -75.132314; Block 30, Lot 4). Jacob Harris Lane is a public, mostly paved road which becomes an unpaved dirt road approximately 650 feet north of the Site; the entrance to the Site is along the dirt road. The 5.51-acre facility consists of one processing building approximately 12,100 square feet in size, surrounded by partially paved, undeveloped land and wooded areas. The facility is not served by any utilities and appears to have been abandoned. The main operational area which includes the building is 2.4 acres in size. A second historically operational area of approximately 0.3 acre in size, which is undeveloped, is located on the southern portion of the property along Jacob Harris Lane. The two areas are separated by wooded land. Several empty trailers are located throughout the property. Parts of the southern portion of the lot are federally-designated wetlands, including an area which extends from the southwest corner of the on-site building beyond the southern tree line of the main operational area. Branches of Still Run, a braided, winding creek which is a headwater to the Maurice River watershed, are located approximately 500 to 700 feet to the south and east of the Site. The Still Run watershed hosts an endangered flowering wetland plant known as the swamp pink. Groundwater in the vicinity of the Site flows to the south-southeast.

Name: Superior Barrel and Drum initial: ss Date:7/25/2016 Filename: Superior Barrel and Drum 2014 RSE								
Symbol	ERRD-RAB	ERRD-RAB	ERRD-RAB					
Surname	GREGOR MEG	WILSON	ROTOLA					
Date	07/25/2016	7/25/2016	7/25/16					

439416

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

DATE: JUL 2 5 2016

SUBJECT: Removal Site Evaluation for the Superior Barrel and Drum Site, Elk Township, Gloucester County, New Jersey (Site ID A23K, CERCLIS ID NJD986630705)

FROM: Margaret Gregor, On-Scene Coordinator
Removal Action Branch

TO: Joseph D. Rotola, Chief
Removal Action Branch

The purpose of this Removal Site Evaluation is to document the findings of the multi-media removal assessment conducted by the United States Environmental Protection Agency (EPA) Region II Removal Action Branch (RAB) at the Superior Barrel and Drum Site (Site), a former drum and container reconditioning facility and wholesale industrial supplier located in Elk Township, Gloucester County, New Jersey. The assessment was conducted between May and November 2014 to determine whether contaminants from containers which were removed from the Site were still present on-site and in the Site vicinity at levels which pose a threat to human health or the environment.

The Site is located at 798 Jacob Harris Lane, also known as 830 Jacob Harris Lane (formerly New Jersey Avenue), in Elk Township, Gloucester County, New Jersey (coordinates 39.6869, -75.132314; Block 30, Lot 4). Jacob Harris Lane is a public, mostly paved road which becomes an unpaved dirt road approximately 650 feet north of the Site; the entrance to the Site is along the dirt road. The 5.51-acre facility consists of one processing building approximately 12,100 square feet in size, surrounded by partially paved, undeveloped land and wooded areas. The facility is not served by any utilities and appears to have been abandoned. The main operational area which includes the building is 2.4 acres in size. A second historically operational area of approximately 0.3 acre in size, which is undeveloped, is located on the southern portion of the property along Jacob Harris Lane. The two areas are separated by wooded land. Several empty trailers are located throughout the property. Parts of the southern portion of the lot are federally-designated wetlands, including an area which extends from the southwest corner of the on-site building beyond the southern tree line of the main operational area. Branches of Still Run, a braided, winding creek which is a headwater to the Maurice River watershed, are located approximately 500 to 700 feet to the south and east of the Site. The Still Run watershed hosts an endangered flowering wetland plant known as the swamp pink. Groundwater in the vicinity of the Site flows to the south-southeast.

The Site is bordered to the north by the Industrial Drum Company, a competitor in the drum reconditioning business. A chain-link fence separates the two properties. Jacob Harris Lane marks the eastern boundary of the Site, beyond which is a densely forested private property. To the south are privately-owned undeveloped lands which are also densely wooded with several

marshy areas. The Site is bordered to the west by undeveloped, densely forested land and State Route 55, a major highway. The closest residential properties are located approximately 0.25 mile east and southeast of the Site along Whig Lane. These properties obtain potable water from private wells.

From the mid-1980s through late 2012 or early 2013, the facility was operational and would receive, rinse, recondition and resell 55-gallon drums and other containers on-site, utilizing machinery within and to the south of the on-site building. Historic aerial photographs indicate that during this time frame, containers and trailers continuously accumulated in the open outdoor areas on-site. By June 2013, it became apparent that the facility was no longer being maintained and was abandoned. Thousands of containers in various states of deterioration were stored outdoors in both operational areas of the Site and inside the building. Following inspections of the facility by the Gloucester County Fire Marshal's Office and Hazardous Materials Response Unit in August 2013, the New Jersey Department of Environmental Protection (NJDEP) Bureau of Emergency Response visited the property and collected samples for field testing from four random containers throughout the Site. Results indicated that flammable substances, toluene-based materials and high pH solutions were present in the containers. NJDEP requested the assistance of EPA on August 29, 2013 with investigating conditions of containers at the facility, and referred the Site to EPA on August 30, 2013.

Following receipt of an Administrative Warrant due to an unresponsive property owner, EPA conducted an initial removal assessment of the Site between September 13 and 27, 2013. This assessment indicated that over 2,000 drums and containers were present throughout the Site, and many were found to be in severely deteriorated condition: leaking contents onto the ground, void of tops, exposed to weather elements, rusted, damaged due to gunshots, stored improperly, and laying on their sides. Container contents had pooled on the ground in many areas. Some containers were found in standing water. Drums and totes were stored so densely in the southern operational area that it could not be accessed. EPA collected samples from a random selection of 252 containers throughout the Site for hazardous categorization field analyses, and confirmatory laboratory analysis was conducted for 79 of these containers. Environmental samples, including 36 surface soil and 4 surface water samples, were also collected and sent for confirmatory laboratory analysis. The analyses indicated that numerous Comprehensive Environmental Resource, Conservation and Liability Act of 1980 (CERCLA) designated hazardous substances were present within on-site containers, surface soil and surface water, including benzene, toluene, trichloroethylene, ethylbenzene, xylenes, polychlorinated biphenyls (PCBs) and lead. Many of these compounds were found in containers that were actively leaking onto surface soils. Similarities between the hazardous substances found within the containers and the soil confirmed that the on-site soil contamination was attributable to releases from the containers. Although some elevated contaminant levels were found in surface soil, none exceeded the EPA Removal Management Level (RML) for industrial soil or the NJDEP Non-Residential Direct Contact Soil Remediation Standards during this initial assessment.

Based on the observed releases and potential for additional releases of hazardous substances from on-site containers, and following receipt of a second Administrative Warrant, EPA conducted a CERCLA removal action on-site between September 27, 2013 and September 24, 2014. The removal action consisted of securing the Site and the characterization, consolidation,

sampling, analysis and removal of over 2,200 containers including drums, industrial totes and cylinders, totaling approximately 210,000 gallons of waste. Laboratory analysis of the container contents revealed high concentrations of volatile organic compounds (VOCs) and heavy metals, including styrene up to 780,000 parts per million (ppm), toluene up to 470,000 ppm, trichloroethylene up to 7,100 ppm, lead up to 2,800 ppm and benzene up to 350 ppm. Additional non-hazardous waste materials were removed from the Site for recycling, including approximately 75 tires and 160 cubic yards of scrap metal. All waste was removed from the Site by July 8, 2014. Following the removal of all waste materials, on September 10, 2014, EPA excavated approximately 60 cubic yards of stained soil from the surface to a depth of up to one foot to alleviate visual and olfactory signs of impact from the former on-site containers. On September 24, 2014, the stockpiled soil was shipped off-site for proper disposal, concluding the removal action.

EPA began removal assessment activities at the Site in spring 2014 to determine whether contaminants which had migrated from the on-site containers and other waste via weathering, container leakage/spillage, dumping and/or surface water transport posed a threat or potential threat to human health and the environment, both on- and off-site. The assessment consisted of sediment, soil and groundwater sampling as well as a geophysical investigation. All media samples were analyzed for Total Contaminant List (TCL) VOCs, TCL semi-volatile organic compounds (SVOCs), pesticides, PCBs, and Target Analyte List metals plus mercury and cyanide.

Sediment Sampling

On March 11, 2014, EPA personnel and a representative of the United State Fish and Wildlife Service (US FWS), the Natural Resource Trustee for the Site, conducted a Site visit to identify sensitive ecosystems in the vicinity of the Site. Two vernal pools (amphibian reproductive areas) and the habitat along Still Run which hosts an endangered species, the swamp pink (*Holonias bullata*), were identified, and sediment sampling locations were discussed. On May 5, 2014, sediment sampling was completed in the wetlands and ecologically sensitive areas both on- and off-site. A total of 19 locations were sampled in accordance with recommendations from the US FWS. This included one off-site and hydrologically upgradient background location within the same wetland system, 12 locations along three transects running downgradient from the Site through a large on-site vernal pool in the federally-designated wetland, four locations along Still Run, and two locations in other areas of interest: the second, smaller vernal pool and a suspected disposal pit on-site. The 12 locations in the large vernal pool were in an area downgradient of the main surface water drainage pathway on-site, where containers had been stored.

Sediment results were compared to the most stringent cleanup criteria: the EPA RML for residential soil, the NJDEP Residential Direct Contact Soil Remediation Standards (residential soil criteria), and the NJDEP Fresh Water Sediment Criteria against which the ecological impact can be evaluated: the Lowest Effects Level (LEL) and Severe Effects Level (SEL). The LEL represents the concentration at which adverse benthic impact may begin to occur, and the SEL indicates severe impact to benthic communities. Results were provided to the US FWS and were reviewed by an EPA risk assessor.

Results indicated that no contaminants are present in sediment above the EPA RML for residential soil. Contaminants exceeded NJDEP residential soil criteria in only one location, P003-SD001, the furthest downgradient sampling point. This location is the furthest downstream on the bank of Still Run and is on the east side of a historic railroad bed/walking path through which Still Run flows. Four SVOCs exceeded the NJDEP residential soil criteria in this location: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluroanthene and indeno(1,2,3-Cd)pyrene were detected at 2,600, 2,100, 2,600 and 1,100 parts per billion (ppb), respectively, compared to the NJDEP residential soil criteria of 200 ppb for benzo(a)pyrene and 600 ppb for the other three parameters. These four SVOCs are polynuclear aromatic hydrocarbons (PAHs), a type of SVOC. These contaminant levels are well below the EPA RML for residential soil: 41,000 ppb for benzo(a)pyrene and 15,000 ppb for the other three parameters. The detections are above the NJDEP LEL but well below the NJDEP SEL. While these contaminants were not detected in any of the other sediment samples, including the upstream locations within Still Run, or in any on-site groundwater samples, the four SVOCs were detected in two soil samples on-site approximately 1,000 feet to the northwest. Based on the lack of additional detections creating a pattern, it is unknown if these contaminants are Site-related.

There was only one contaminant detection which exceeded the NJDEP SEL, but neither the EPA nor the NJDEP standards for residential soil. The SVOC di-n-buthyl phthalate, which is not considered to be bioaccumulative, was found in the location furthest upstream within Still Run (P002-SD003). This chemical was found at low levels in four soil sampling locations on-site, but was not detected in groundwater. It is unknown whether this detection is Site-related.

Additional contaminant detections exceeded only the NJDEP LEL. Several SVOCs were detected in two samples, and two pesticides were found in three locations. In the furthest downstream sampling point within Still Run (P003-SD001), the SVOCs detected at levels above the LEL were anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, di-n-butyl phthalate, fluoranthene, indeno(1,2,3-Cd)pyrene, phenanthrene and pyrene. Within the large vernal pool which is partially within the south portion of the Site parcel, the pesticide 4,4'-DDE was found above the LEL in two of the 12 locations and 4,4'-DDT was found above the LEL in a third. The locations where 4,4'-DDE was detected are approximately 70 feet apart, but a third location in the vicinity (less than 50 feet from both locations) did not contain 4,4'-DDE, indicating that the contamination is not widespread. All of these contaminants were detected within on-site containers and in on-site soil at very low levels in various areas throughout the Site, but were not detected in on-site groundwater or any other sediment samples.

Metals exceeded the NJDEP LEL in numerous locations throughout the sampling area: arsenic (four locations), cadmium (two locations), chromium (one location), copper (four locations), lead (12 locations), nickel (one location), silver (11 locations), zinc (three locations), mercury (two locations) and cyanide (all 19 locations). The detections had a random, sporadic distribution throughout the Site. Although all of these metals with the exception of silver and mercury were found in on-site groundwater, based on the random distribution of the contaminants and the fact that many of these metals are naturally occurring and present at low levels, it is unclear if these metals are Site-related.

It should be noted that VOCs were not detected at concentrations exceeding any screening levels. One location, the smaller off-site vernal pool, contained low levels of toluene and ethylbenzene, and a location within Still Run contained styrene. A third location within the large vernal pool which is partially on-site, contained 2-hexanone and carbon disulfide. These contaminants were all detected at very low levels, and were not present in any of the other sediment sampling locations. PCBs were not detected in any sediment samples.

Based on the presence of multiple potentially Site-related VOCs, SVOCs, pesticides and metals throughout the sediment sampling area, it is possible that there has been a release of CERCLA-designated hazardous substances from the Site to the downgradient sediments via surface water discharge. Although some of the undeveloped areas downgradient of the Site are utilized for hunting and camping, the areas where contaminants were found are undeveloped and are not easily accessible or continually occupied. None of these parameters were detected above the EPA RML for residential soil. Based on this information, these contaminants do not represent an acute threat to human health or welfare.

Contaminants were found in sensitive ecosystems including the federally-designated wetland, vernal pools and creek which supports an endangered species. An ecological risk screening conducted for the Site indicated that based on the presence of contaminants at levels exceeding the NJDEP LEL and analysis of the data using food chain models, there may be potential risks to benthic invertebrates and piscivorous birds exposed to sediment in Still Run and the wetlands at the Site. However, the contaminants are not present in sufficient concentrations to represent a severe, immediate or acute threat to the ecosystem or an impact to the food chain or the ecosystem as a whole. Minimal risks were found for mammalian piscivores. Based on this information, these contaminants do not represent a significant threat to the environment. Due to the presence of an endangered species habitat in the general area of the most downgradient location, the NJDEP will be provided with all data from the sediment screening.

Geophysical Investigation

On July 8, 2014, a geophysical investigation of the Site was completed. The objective was to determine whether buried objects were present, including tanks, drums and pipelines. Both ground-penetrating radar and electromagnetic induction (electromagnetic terrain conductivity) were utilized to survey the two formerly operational areas of the Site as well as Jacob Harris Lane along the east portion of the Site, due to the storage of thousands of containers throughout the Site and on the road in historic aerial photographs dating back to the early 1990s.

The geophysical investigation indicated numerous anomalies throughout both the Site and the road; the majority appeared to be indicative of shallow metallic debris including drum lids, drum lid rings and pieces of broken metal drums and containers. These findings were consistent with materials viewed throughout the Site in the shallow soils during the removal action, which were occasionally uncovered by vehicular equipment. A larger anomaly (approximately 10 feet by 10 feet in size) found in the southern portion of Jacob Harris Lane, centered along the southern operational area, appeared to be a shallow, flat metallic object. Based on the historic storage of numerous trailers in this area, the anomaly was suspected to be the door of a truck or trailer, or a portion of a trailer wall. An additional large anomaly, thought to be a curved part of a broken

drum, was detected approximately 35 feet northeast of the main Site building. This object was detected at approximately six inches to one foot below the surface, but limited soil excavation in the area of this object to one foot did not uncover the object. Additional equipment which was not available on-site would have been required to excavate the anomalies. Because these two larger anomalies did not appear to be indicative of significant objects including buried tanks or containers or a cache of buried drums, and subsequent soil and groundwater sampling (discussed below) did not indicate impacts from a release in these areas, further investigation was not warranted.

In addition to the suspected metallic debris, the geophysical investigation revealed the presence of three subsurface piping features. A natural gas line runs down the eastern side of Jacob Harris Lane and turns sharply towards the southeast corner of the Site building. The line then continues south almost to the tree line, turns west and runs approximately 60 feet to the machinery outside the southeast portion of the main Site building. It is suspected that the line was disconnected at the point of juncture with the building when the gas service was turned off. Secondly, a water line extends from the north side of the Site building, approximately 30 feet from its northwest face. The line leads perpendicularly north of the building to a well which is visible on-site, and which has been abandoned via concrete fill. Records of this well were not found at the local municipal departments. Lastly, a concrete pipe which runs north-northwest to south-southeast is located west of the Site building, but does not turn or connect to the building. A dye test on the floor drain in the west portion of the Site building, which was conducted in early 2014 during the removal action, confirmed that the floor drain leads directly outside of the building wall, and does not discharge to this pipe. The pipe changes from concrete to polyvinyl chloride (PVC) approximately 20 feet north of the southern tree line for the main operational area, and its discharge point is visible within the area of the large vernal pool. Based on a review of aerial photographs as well as observations of Site conditions during the removal action, the area where this pipe is located is one of the main surface water drainage pathways on-site. Therefore, it is suspected that this pipe was intended to function as a drainage pipe at some point.

It was also noted that the majority of the main operational area was historically paved with asphalt, which varies from intact to broken and is now covered with several inches of soil. The paving is discontinued on the westernmost portion of the main Site area. This confirmed observations made during the removal action while vehicular equipment scraped the surface to move containers and pallets and shovel snow.

The geophysical investigation did not reveal any major subsurface features such as drum disposal areas or storage tanks. Based on this information, additional EPA investigation and/or a CERCLA removal action are not warranted at this time with respect to buried objects.

Soil Sampling

Between July 21 and 28, 2014, soil sampling was conducted on-site to determine whether hazardous materials from leaking containers and other waste historically present on-site had resulted in elevated contaminant levels in soil that posed a risk to public health or the environment via direct contact. A total of 46 locations were selected for soil sampling. Thirty of the locations were chosen following an unbiased grid pattern randomly generated with Visual

Sampling Plan™ software, providing full coverage over both operational areas of the Site. Grid sampling locations were separated by approximately 70 feet. The remaining 16 locations, referred to as targeted locations, were chosen in areas of interest based on visual and topographic features, including manmade features such as pits and berms; depressions, low-lying areas and surface water drainage pathways where liquids may have historically collected; stained areas where historic releases may have occurred; and sensitive environments in close proximity to historic container storage.

A total of 109 soil samples were collected from the 46 locations. At 42 of the 46 locations, a soil boring was advanced to a depth of five feet below ground surface (bgs) using a GeoProbe drilling rig. Sample collection at all locations followed a uniform methodology. One surface sample was collected from the surface of every location, from zero to six inches bgs. At least one additional sample was then collected from a discrete depth interval(s) within each soil core; the depth intervals were 6-12", 12-24", 24-36", 36-48" and 48-60" bgs. The depth interval(s) from which the depth sample(s) was collected was determined by scanning the core visually and with field screening instruments for evidences of releases. Sample collection depths were chosen at depth intervals which exhibited staining or elevated VOC or heavy metal concentrations. The screening instruments were a MultiRae photoionization detector (PID) to detect VOCs within the soil gas of the core and an x-ray fluorescence (XRF) detector to detect heavy metals. If there was no indication of a release from the visual and instrument screening, a sample was collected from a default interval of 6-12" bgs, since this interval was most likely to exhibit contamination from surface releases. Therefore, between two and six samples were collected from each of 42 locations. Instrument screening data was recorded in the soil boring logs. In the remaining four locations, which were all targeted locations, a sample from only the 0-6" depth interval was collected.

Analytical results revealed the presence of 13 contaminant detections within six locations which exceeded EPA or NJDEP screening levels. Of these detections, only one exceeded the EPA RML for industrial soils: the VOC m,p-xylene was found at 9,400 ppm, compared to the EPA RML of 2,400 ppm, in the surface soil on the west portion of the Site, near the northern tree line. This area exhibited visible soil staining.

The other 12 elevated detections were above the NJDEP Non-Residential Direct Contact standard, but well below the EPA RML. These detections included Aroclor-1260 (a PCB), Dieldrin (a pesticide) and six SVOCs: acetophenone, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene and naphthalene. All of these detections were in the surface sampling interval (0-6" bgs), with the exception of the two detections of Aroclor-1260, which were found at the 12-24" bgs sampling interval in the southwest portion of the main operational area, near a large manmade berm. In addition to these exceedences, low-level contamination, below the EPA and NJDEP screening levels, was detected throughout both operational areas of the Site. Common contaminants included the VOCs m,p-xylene, o-xylene, ethylbenzene, isopropylbenzene, toluene and styrene, which is consistent with contaminants found in many of the on-site containers which were removed. Metals were not detected above either EPA or NJDEP standards throughout the sampling area.

The aforementioned September 10, 2014 on-site soil excavation included soil removal in most of the locations where elevated contaminants were detected, due to visual and/or olfactory indications of releases. Following receipt of all July 2014 soil sampling results and the soil excavation, on October 29, 2014, EPA re-sampled the six locations where elevated contaminant levels were detected; a total of eight samples were collected. The purpose was to confirm that the releases had been fully addressed or, where soil was not removed, to confirm the July 2014 soil results.

Results of the October 29, 2014 sampling event indicated that the majority of the observed contaminants found above the EPA or NJDEP screening levels in the July 2014 sampling were not present on-site following the September 2014 soil removal. However, in the surface soil within one location on the north-central portion of the main operational area (location P001-GS025), the SVOCs benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h,)anthracene were detected at 2.3, 2.1 and 0.31 ppm, compared to their respective NJDEP criteria of 2.0, 0.2 and 0.2 ppm. These contaminants were present in only one sampling location and do not exceed the EPA RMLs for industrial soil (290, 29 and 29 ppm, respectively). Based on the localized nature of these substances and the concentrations below the applicable EPA RMLs, the presence of these substances is not expected to represent an acute threat to human health or welfare or the environment. Further investigation and a CERCLA removal action are not warranted to address this contamination. However, NJDEP will be notified of the exceedences. It appears that the September 2014 soil excavation effectively removed the soil in the other locations which had exhibited elevated contaminant levels in July 2014.

Groundwater Sampling

From July 28 to 29, 2014, three temporary shallow groundwater wells (less than ten feet deep) were installed on-site to verify the Site-specific direction of groundwater flow, and a survey of the wells was completed. The groundwater flow direction on-site was confirmed to be to the south-southeast. From August 18 through September 3, 2014, groundwater sampling was conducted on-site to determine if leaking containers or potentially dumped material had impacted the groundwater and could result in contaminant migration to local drinking water and agricultural distribution systems. All residents in Elk Township rely on well water. The closest groundwater drinking wells shallower than 100 feet bgs are located in a residential neighborhood approximately 1/3 to 3/4-mile south and southeast of the Site, hydrologically downgradient. These shallow wells would be most at risk for any potential Site-related contamination due to the surficial nature of historic on-site releases. Deeper wells are not likely to be impacted by Site-related contaminants due to the presence of confining layers within the local aquifer, which are further discussed below.

Groundwater was collected from temporary wells in six locations throughout the Site, identified as TW-01 through TW-06. Each location included three clustered temporary wells of varying depths from which samples were collected (one sample per well), totaling 18 samples (plus QA/QC samples). Two of the six locations were chosen to represent the furthest upgradient and downgradient areas of the Site (well locations TW-01 and TW-02, respectively). The other four

locations were placed throughout the Site immediately downgradient of the areas which had exhibited the highest soil contaminant levels during the July 2014 soil sampling, as these areas were most likely to show impact.

Groundwater samples were collected at depth intervals between the water table interface (between 5 and 10 feet bgs, the surface of the water table) and 60 feet bgs, which is representative of many of the drinking water wells in the localized area and is also the depth range most likely to be impacted by contaminants from containers which historically leaked on-site. The upgradient well (TW-01) was drilled to a depth of nearly 100 feet, but the deepest sampling interval was chosen at 55-60 feet bgs due to the presence of a thick, confining clay layer between 60 and 95 feet bgs, which appeared to extend throughout the Site. In the furthest downgradient well (TW-02), the deepest sampling interval was chosen immediately above this confining layer, at 57-62 feet bgs. The boring was not advanced further than 65 feet bgs, to avoid creating a conduit through the confining layer which could allow any potential contamination to migrate deeper within the aquifer. Samples from groundwater deeper than 62 feet bgs could not be collected due to the presence of the clay layer. The other four wells were drilled to a depth of 50 feet bgs. The stratigraphy of the deepest boring core at each location was visually analyzed. Within all six locations, groundwater was sampled at the groundwater table interface and two additional depths, chosen based on confining layers within the core and/or at the deepest depth interval.

Results indicated that elevated levels of the VOCs ethylbenzene and tetrachloroethene (PCE) as well as several metals are present in groundwater on-site. Almost all of the substances are present only in the shallowest groundwater depth, with the exceptions of iron and manganese. The iron concentration exceeded the EPA RML for residential drinking water in nine of the 18 water samples (including one duplicate) at various depths and was present within all on-site wells, but was not elevated in the furthest upgradient well. Iron concentrations above the EPA RML of 14,000 ppb ranged from 15,000 to 89,000 ppb. Manganese was also detected at all depths throughout the Site but was present above the RML only in three of the shallowest groundwater samples; concentrations ranged from 470 to 1,900 ppb, compared to the EPA RML of 430 ppb. According to information from the NJDEP and a 2008 Environmental Resource Inventory for Elk Township prepared by the Delaware Valley Regional Planning Commission and the Environmental Commission of Elk Township, the Kirkwood-Cohansey Aquifer located beneath the Site has naturally elevated iron and manganese concentrations. Based on this information and the various depth intervals at which iron and manganese concentrations were detected, it appears that the iron and manganese concentrations in on-site groundwater may be naturally occurring rather than Site-related.

With the exception of iron, the contaminants in the table below were found above either the EPA RML or the federal Maximum Contaminant Level (MCL). It should be noted that both the MCL and the EPA RML are intended to be cleanup levels for residential drinking water, but potable water is not available on-site. Nonetheless, these criteria are provided as a basis of comparison for evaluating potential off-site impacts. The well locations are listed from the furthest upgradient to the furthest downgradient location on-site.

Contaminant Detections in Groundwater Exceeding Cleanup Criteria

Well Location	Sample Depth	Parameter	Result (ppb)	MCL	EPA RML	NJDEP GWQS*
TW-03, furthest west in main area	Water table interface	PCE	8.9	**5.0**	41	**0.4**
	45-50 feet bgs	Arsenic	12	**10.0**	**5.2**	**0.2**
TW-04, main area	Water table interface	Arsenic	15	**10.0**	**5.2**	**0.2**
TW-05, main area	Water table interface	Manganese	470	—	**430**	**50**
TW-06, secondary operational area	Water table interface	Arsenic	8.3	10.0	**5.2**	**0.2**
		Ethylbenzene	240	700	**150**	700
		Manganese	850	—	**430**	**50**
TW-02, furthest downgradient location**	Water table interface	Aluminum	45,000 42,000	—	**20,000**	**200**
		Arsenic	17	**10.0**	**5.2**	**0.2**
		Chromium	170, 180	**100**	—	**70**
		Cobalt	34, 32	—	**6.0**	—
		Lead	98, 86	**15.0**	—	**5.0**
		Manganese	1,900 1,700	—	**430**	**50**
		Vanadium	98, 91	86	—	—

Notes:
All data and criteria are reported in parts per billion (ppb).
Criteria does not exist for some parameters, as noted by "—".
The criteria which were exceeded are listed in **bold** text.
*NJDEP Groundwater Quality Standard
**A duplicate sample was collected in this location for QA/QC purposes; both results are listed unless they were identical.

The data indicate that the above-listed, potentially Site-related contaminants within wells at TW-03, TW-04 and TW-06 are not migrating within the Site boundaries, either horizontally or vertically through the water table. These well locations, as well as TW-02, are situated roughly in line with each other and are oriented in a northeast to southwest direction similar to the overall direction of groundwater flow on-site. Because these well locations are in relatively close proximity to each other (between 100 and 475 feet), if contaminants were migrating, it is expected that contaminants present in each well would also be present in the respective downgradient wells. Conversely, PCE found in the shallowest depth at TW-03 was not detected

either deeper within the water column or at any depth in any of the three downgradient wells. Ethylbenzene found in the shallowest depth at TW-06 was detected only at a very low level (1.7 ppb) deeper within the water column and was not detected at any depth in the downgradient well location (TW-02), which is located only approximately 100 feet away. Both of these VOC detections were found downgradient of soil sampling locations which contained the same contaminants; the elevated groundwater detections appear to be attributable to releases from containers formerly on-site. Lastly, although arsenic was detected at the deepest interval (45-50 feet bgs) in one location (TW-03) and in the shallowest interval in two other downgradient locations (TW-04 and TW-02), it was not detected in multiple intervals in any location, and it is not present at all downgradient locations within the Site boundaries. It should be noted that arsenic may be naturally occurring in groundwater due to climatic conditions and geology. Well location TW-05, which is located in the vicinity of these wells along the eastern boundary of the Site, did not exhibit any elevated contaminant levels with the exception of manganese, which was also found in the furthest upgradient location. The sporadic distribution of PCE, ethylbenzene and arsenic throughout the Site and the lack of vertical migration does not indicate that these contaminants are widespread enough to potentially migrate off-site in significant concentrations. Since the on-site groundwater is not utilized as a potable water source, these detections are not expected to represent a threat to human health or welfare.

At the furthest downgradient well location, TW-02, it does not appear that the contaminants which were present at elevated levels are migrating vertically through the depth of the water table. No contaminants were present above the RML or MCL at either the 30-35 feet or 57-62 feet bgs sampling intervals; only low levels of aluminum, chromium and manganese were present in all depths sampled, and these metals may be naturally occurring in groundwater. The lack of vertical contaminant migration could be due to the presence of a confining silt and clay layer approximately two feet thick discovered just below the water table interface.

In addition, the sediment sampling results do not indicate that contaminants within TW-02 are migrating horizontally off-site. Although a sediment sample collected from a small vernal pool downgradient of TW-02 exhibited low levels of the Site-related contaminants toluene (15 ppb) and ethylbenzene (97 ppb), overall, the sediment sampling results did not show a pattern to indicate that Site-related contaminants, including those found in groundwater, are discharging to sediment or migrating off-site. Additionally, the compounds detected at elevated concentrations within TW-02 are metals, which are generally likely to naturally attenuate due to sorption onto aquifer solids in combination with the long-term stability of immobilized contaminants to resist remobilization.

While most of the exceedences within TW-02 were of relatively low magnitude, the most significant exceedance was for lead, which was detected at 98 and 86 ppb, compared to the MCL of 15 ppb. Although the fate and transport of lead in groundwater is highly complex, it is generally understood that lead has a tendency to form compounds of low solubility with the major anions found in natural waters, causing it to sorb to solids or precipitate out of the water column. Lead has a particularly high absorptive affinity to iron oxides, which, based on the sampling results and known characteristics of the local aquifer, are prevalent in the localized groundwater and sediments. This Site-specific condition would likely hinder the mobility of the

lead found within the upper depth interval of the TW-02 location, preventing it from traveling off-site and migrating to downgradient areas at significant concentrations.

Lastly, the regional geology and hydrology of the areas downgradient of the Site may also inhibit the movement of the contaminants into residential water supply wells in the event that they did migrate off-site. Branches of Still Run are located less than 700 feet to the south and east of the Site, converging approximately ¼-mile south-southeast (hydrologically downgradient) of the Site. This creek is a headwater to the Maurice River watershed, meaning it draws from the local shallow aquifer. Immediately beyond the east branch of this creek is a lake of over three acres in size. These features would likely act as a hydraulic barrier downgradient of the Site and would also dilute contaminants in the event that any migrated off-site. Dilution of contaminants would be furthered by the distance from the Site to the downgradient residential neighborhood on private wells, 1/3 to 3/4-mile from the Site.

The groundwater data indicate that there has been a release of CERCLA-designated substances to on-site groundwater. However, based on the lack of observed vertical and/or horizontal contaminant migration, the contaminant detections appear to be localized to the immediate vicinity of the Site. The on-site groundwater is not utilized as a potable water source. In addition, based on the low magnitude of most of the exceedences, the likelihood for inorganic contaminants to sorb to solids and precipitate out of the water column, and the local hydrogeologic features, it is highly unlikely that any Site-related contamination could impact the downgradient residential wells in the area. Therefore, the release of CERCLA-designated substances to the on-site groundwater is not expected to represent a significant threat to human health or the environment.

Findings of the removal assessment field work indicates that there has been a release of CERCLA-designated substances (as defined in Section 101[14] of CERCLA, 42 U.S.C. § 9601) at the Site, which is a facility as defined under section 101(9) of CERCLA. Site-related contaminants were detected within on-site and off-site sediment, on-site soil and on-site groundwater. However, based on the available information, the presence of these contaminants does not currently represent a significant threat to human health or welfare or the environment. Conditions at the Site do not meet the requirements of Section 300.425 (b) of the National Contingency Plan for the undertaking of a CERCLA removal action at this time.

cc: E. Wilson, ERRD-RAB
A. Fessler, ERRD-SPB
B. Grealish, ERRD-RAB
EPA Region II Removal Records Center
J. Salabritas, NJDEP